

Application No.: 09/730,277
Attorney Docket No.: 24958A

IN THE CLAIMS

1.-6. Canceled

7. (Currently Amended) An apparatus for cooling filaments in a filament forming process, the filaments attenuated from a bottom plate of a bushing, the apparatus comprising:
a bushing having a generally planar bottom plate;
an air nozzle operable to conduct the flow of air;~~a first air-emitting nozzle;~~ and
a fluid second fluid-emitting nozzle positioned downstream of said air first
nozzle[.]; and
a gathering shoe to gather said filaments into a strand,
wherein said air and fluid first and second nozzles point downwardly away from the
bushing bottom plate; and a gathering shoe for gathering said filaments into a strand.

8.-10. Canceled

11. (Currently Amended) The apparatus of claim 7, wherein the fluid second-nozzle emits water, and further comprising:
a first manifold coupled to said air first-nozzle to convey ~~for conveying the air thereto;~~
and
a second manifold coupled to said fluid first-nozzle to convey ~~for conveying the water thereto.~~

12. (Currently Amended) The apparatus of claim 7, further comprising:
a size applicator.

13. (Currently Amended) The apparatus of claim 12, wherein said air first-nozzle is directed toward a filament forming region between said bottom plate and said size applicator and in a direction downstream along the filaments relative to a plane parallel to said bushing bottom plate.

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14. (Currently Amended) The apparatus of claim 13, wherein said air first-nozzle is oriented at an angle relative to said plane, the angle being in the range of 0 to 35 degrees.

15.-27. Canceled

28. (Currently Amended) An apparatus for cooling filaments in a filament forming process comprising:

a bushing having a bottom plate;

an air nozzle operable to conduct a flow of air, said air nozzle being a first air-emitting nozzle located at a first position;

a fluid nozzle operable to spray a fluid, said fluid nozzle being second fluid-emitting nozzle located at a second position downstream of said air first-nozzle, and

a size applicator[[,]];

a gathering shoe to gather said filaments into a strand,

wherein said air first-nozzle and said fluid second-nozzle are positioned upstream of the size applicator, wherein said air first-nozzle and said fluid second-nozzle are positioned downstream of said bushing, and wherein said air and said fluid first and second-nozzles point downwardly away from the bushing bottom plate; and

~~—— a gathering shoe for gathering said filaments into a strand.~~

29. (Currently Amended) The apparatus of claim 28, wherein the air first-nozzle does not emit water.

30. (Currently Amended) The apparatus of claim 7, wherein the air first-nozzle does not emit water.

31. (Currently Amended) An apparatus for cooling filaments in a filament forming process comprising:

a bushing having a bottom plate from which filaments emanate;

an air a first-nozzle located at a first position, said air nozzle being operable to conduct for delivering compressed air to cool for use in cooling the filaments that emanate emanating from the bottom plate of the bushing;

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a fluid nozzle operable to spray a fluid, said fluid nozzle being second fluid-emitting
~~nozzle~~ located adjacent the filaments at a second position downstream of said air first nozzle;
a size applicator downstream of the fluid nozzle ~~second fluid-emitting nozzle~~; and
a gathering shoe to gather ~~for gathering~~ the filaments into a strand.

32. (Currently Amended) The apparatus of claim 31, wherein the air first nozzle does not emit water.

33. (Currently Amended) The apparatus of claim 31, wherein the air and fluid first and second nozzles emit water.

34. (Currently Amended) An apparatus for cooling filaments in a filament forming process comprising:

a bushing having a bottom plate from which filaments emanate;
an air nozzle operable to conduct the flow of air ~~a first nozzle~~ located at a first position to cool and dry ~~for cooling and drying~~ the filaments ~~emanating from the bottom plate~~; and

a fluid second fluid-emitting nozzle operable to spray a fluid located at a second position downstream of said air first nozzle;

~~a size applicator downstream of the second fluid-emitting nozzle; and~~
~~----- a gathering shoe for gathering said filaments into a strand.~~

35. (Previously Presented) An apparatus for cooling filaments in a filament forming process comprising:

a bushing having a bottom plate from which filaments emanate;
means for emitting air to the filaments emanating from the bottom plate;
means for emitting fluid to the filaments downstream of the means for emitting air;
a size applicator downstream of the means for emitting fluid to the filaments; and
a gathering shoe for gathering said filaments into a strand.

36. (Currently Amended) The apparatus of claim 35, wherein the means for emitting air comprises an air nozzle operable to conduct the flow of air ~~air-emitting nozzle~~.

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37. (Currently Amended) The apparatus of claim 35, wherein the means for emitting fluid comprises a water nozzle operable to conduct the flow of water ~~water emitting nozzle~~.
38. (New) The apparatus of claim 34, further comprising:
a size applicator downstream of the fluid nozzle; and
a gathering shoe for gathering said filaments into a strand.
39. (New) An apparatus for cooling filaments in a filament forming process comprising:
a bushing having a bottom plate from which filaments emanate; and
at least one atomizer nozzle operable to spray an atomized liquid;
wherein said at least one atomizer nozzle is positioned downstream of said bushing and is oriented to convey said atomized liquid to said filaments.
40. (New) The apparatus of claim 39, wherein said at least one atomizer nozzle is directed toward said filaments at an angle relative to a plane parallel to said bushing bottom plate, said angle being in the range of 0 to 35 degrees.
41. (New) The apparatus of claim 40, wherein said at least one atomizer nozzle comprises a single row of atomizer nozzles.
42. (New) The apparatus of claim 41, wherein said liquid is water.
43. (New) The apparatus of claim 39, further comprising a size applicator;
wherein said at least one atomizer nozzle is positioned upstream of said size applicator.
44. (New) The apparatus of claim 43, wherein said at least one atomizer nozzle is positioned at a primary position at a front location of said apparatus; and
wherein said at least one atomizer nozzle is positioned downwardly away from said bushing plate and is directed toward said filaments.

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45. (New) The apparatus of claim 43, wherein said at least one atomizer is positioned at a secondary position at a rear location of said apparatus; and
wherein said at least one atomizer is directed upwardly toward said bushing plate and is directed toward said filaments.
46. (New) The apparatus of claim 43, further comprising:
a manifold connected to said at least one atomizer to convey water and compressed air thereto.
47. (New) An apparatus for cooling filaments in a filament forming process comprising:
a bushing having a bottom plate from which filaments emanate;
a row of atomizer nozzles operable to spray an atomized liquid;
a size applicator; and
a manifold connected to said row of atomizer nozzles to convey a compressed gas and liquid thereto,
wherein said row of atomizer nozzles is positioned downstream from said bushing and upstream of said size applicator at an orientation relative to a horizontal plane parallel to said bottom plate of said bushing to convey said atomized liquid to said filaments.
48. (New) The apparatus of claim 47, wherein said liquid is water and said compressed gas is air.
49. (New) The apparatus of claim 48, wherein said orientation is an angle from 0 to 35 degrees.
50. (New) The apparatus of claim 47, wherein said row of atomizer nozzles is positioned at a primary position at a front location of said apparatus; and
wherein said row of atomizer nozzles is positioned downwardly away from said bushing plate and is directed toward said filaments.
51. (New) The apparatus of claim 47, wherein said row of atomizer nozzles is positioned at a secondary position at a rear location of said apparatus; and

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wherein said row of atomizer nozzles is directed upwardly toward said bushing plate and is directed toward said filaments.

52. (New) The apparatus of claim 28, wherein said bottom plate of said bushing attenuates the filaments, and said first position is closer to said bottom plate than said second position.

53. (New) The apparatus of claim 28, wherein said fluid nozzle is an atomizer nozzle.

54. (New) The apparatus of claim 28, wherein the fluid nozzle emits water, said apparatus further comprising:

a first manifold, said air nozzle being coupled to said first manifold to convey air thereto; and

a second manifold, said fluid nozzle being coupled to said second manifold to convey water thereto.